AMENDMENTS TO THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double brackets indicating deletions.

Listing of the Claims

1. (PREVIOUSLY PRESENTED) A method for PCR amplification and detection of nucleotide sequences, comprising:

using a hydrophilic reaction layer having coupling groups for covalent binding of probe molecules and an array of a plurality of microspots forming analytical positions, said microspots including, as probe molecules, at least one immobilized oligonucleotide which is hybridizable with a target sequence to be identified of a DNA fragment;

applying an analyte solution including PCR reagents and a plurality of target sequences to the microspots such that the analyte solution completely covers the array;

subjecting the array to a thermocycling process to amplify the target sequences; and

detecting hybridization events on the probe molecules immobilized at one of the analytical positions electrochemically with the aid of a microelectrode arrangement wherein detected nucleotide sequences alter impedance of the microelectrode arrangement.

2. (CANCELLED)

3. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein the reaction layer used is a hydrogel.

4. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein a free-radically crosslinkable hydrogel based on at least one of acrylamide with maleic anhydride and glycidyl (meth)acrylate as coupling groups is used.

5. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein a biochip including a semiconductor layer and an insulating layer connected therewith is used, wherein the electrode arrangement and the reaction layer are carried on a side of the insulating layer, which faces away from the semiconductor layer.

6. (PREVIOUSLY PRESENTED) The method as claimed in claim 5, wherein the semiconductor layer used is a silicon layer.

7. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein the analyte solution includes an external primer pair.

8. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein the analyte solution includes a plurality of DNA fragments having a different target sequence and a single external primer pair suitable for the amplification of all of the target sequences.

9. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein subjecting the array to the thermocycling process includes elongating a counter strand within the reaction layer with the aid of an internal primer immobilized in the reaction layer, wherein the analyte solution includes an external primer acting together with one strand of the DNA fragment.

10. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein the analyte solution includes an internal primer pair which specifically hybridizes with one of the target sequences, the internal primer pair being immobilized in one of the microspots.

11. (WITHDRAWN) A device for carrying out the method as claimed in claim 1, comprising a biochip having an array of microspots which form analytical positions and which are covered by the hydrophilic reaction layer.

12. (WITHDRAWN) The device as claimed in claim 11, wherein the biochip with hydrophilic reaction layer is arranged in a housing having an opening for an analyte solution.

13. (WITHDRAWN) The device as claimed in claim 11, wherein the biochip contains carriers for the microspots as substrate.

14. (WITHDRAWN) The device as claimed in claim 11, wherein the substrate consists of a semiconductor material, to which an insulating layer has been applied.

15. (WITHDRAWN) The device as claimed in claim 11, wherein the biochip is a prefabricated silicon chip having thin-layer microelectrodes implemented therein.

16. (CANCELLED)

17. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein the analyte solution includes a primer pair which hybridizes with a target DNA outside of the target sequences.

18. (CURRENTLY AMENDED) The method as claimed in claim 1, wherein subjecting the array to the thermocycling process includes elongating a counter strand of the DNA fragment within the reaction layer with the aid of a primer which specifically hybridizes with one of the target sequences ~~immobilized~~ in the analyte solution, the analyte solution including an external primer acting together with one strand of the DNA fragment.

19. (WITHDRAWN) The device as claimed in claim 11, wherein the substrate consists of silicon, to which an insulating layer has been applied.

20. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein each electrode of the microelectrode arrangement has a width of 1-μm to 10-μm and a height of 100-nm to 500-nm.

21. (PREVIOUSLY PRESENTED) The method as claimed in claim 1, wherein the reaction layer has a thickness of 5-μm to 10-μm.

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END OF CLAIM LISTING